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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,590	Applicant(s) LIU ET AL.	
	Examiner Kenan Cehic	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/06/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 3-5,8,9,17,18,19,22 objected to because of the following informalities:

For claim 3, the limitation "a link" in claim 3, line 1 seems to refer back to claim 1 line 4. If this is correct it is suggested to change this to –said link--. Similar problems exist in claim 4 line 1, claim 9 lines 2,3,5, claim 17 line 1, claim 18 line 1

For claim 3, the limitation "a neighboring node" line 2 seems to refer back to claim 1 line 4. If this is correct it is suggested to change this to –said neighboring node --. Similar problems exist in claim 4 line 2, claim 17 line 2, claim 18 line 2.

For claim 5, the limitation " one neighboring node" line 3 seems to refer back to claim 5 line 2. If this is correct it is suggested to change this to –said at least one neighboring node --. Similar problems exist in claim 19 line 3.

For claim 8, the limitation "the network lifetime" is the first occurrence. It is suggested to change this to --a network lifetime--. Similar problems exist in claim 22 line 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary

skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claim 1, 3,4,7,9,15,17,18,21,23,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402).

For claim 1, 15, and 25 Muthukrishnan discloses a method (see col 4 line 47-60 "amount of flow is computed for each link....flow of the data is routed across each link") for use in a node (see Fig 1; 10 and col 7 lines 24-35 "repeated iteratively at each switch...each iteration at each switch") of a distributed network (see Fig 1; 10,110 and col 4 lines 30-60

"communication system") for routing packets (see col 4 line 47-60 "amount of flow is computed for each link....flow of the data is routed across each link"), the method comprising the steps of: maintaining queues (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs") for storing packets (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs....data....queue buffer pairs" and col 2 line 65 through col 3 line 5 "packet-routing...route data"), wherein at least one queue is associated with a link (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs") existing between the node and a neighboring node (see Fig 1, 10; 110), and a queue (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs") has a height associated therewith (see col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue"); and determining a route (see col 4 lines 35-60 "amount of the flow of the data is routed across each link", col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such

....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue") for one or more packets stored in the queues (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs....data....queue buffer pairs" and col 2 line 65 through col 3 line 5 "packet-routing...route data") based on heights of queues at neighboring nodes (see col 4 lines 35-60 "amount of the flow of the data is routed across each link", col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue"), such that processing operations/load (see col 7 lines 40-56 "more than 8000 iterations.....method employed ....embodiment....performing 1500 iterations") associated with the node (col 7 lines 24-35 "repeated iteratively at each switch...each iteration at each switch") and the neighboring nodes (col 7 lines 24-35 "repeated iteratively at each switch...each iteration at each switch") are substantially minimized (see col 7 lines 40-56 "more than 8000 iterations.....method employed ....embodiment....performing 1500 iterations").

For claim 3 and 17, Muthukrishnan discloses one or more packets are sent (see col 4 line 47-60 “amount of flow is computed for each link....flow of the data is routed across each link”), over a link (see col 4 line 47-60 “amount of flow is computed for each link....flow of the data is routed across each link”), from a queue (see Fig 1; queue and col 4 lines 30-60 “links having a pair of queue buffers...queue buffer pairs”) of the node (see col 3 lines 30-60 “each of the switches” and fig 1; 10) to a queue (see Fig 1; queue and col 4 lines 30-60 “links having a pair of queue buffers...queue buffer pairs”) of a neighboring node (see col 3 lines 30-60 “neighboring switch”; Fig 1; 110) when the height of the queue of the node is greater than the height of the queue of the neighboring node (see col 4 lines 35-60 “the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs” and see col 5 lines 1-30 ”amount of flow Fi os ....is routed across each said link such ....is maximized” and col 4 lines 58-67 “is defined as the difference in a amount of data between a pair of queue buffers” and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120” and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue")

For claim 4 and 18, Muthukrishnan discloses wherein one or more packets are received (see col 4 line 47-60 “amount of flow is computed for each link....flow of the data is routed across each link”), over a link (see col 4 line 47-60 “amount of flow is computed for each link....flow of the data is routed across each link”), over a link (see col 4 line 47-60 “amount of flow is computed for each link....flow of the data is routed across each link”), in a queue (see Fig 1; queue and col 4 lines 30-60 “links having a pair of queue

buffers…queue buffer pairs") of the node (see col 3 lines 30-60 "each of the switches" and fig 1; 10) from a queue (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers…queue buffer pairs") of a neighboring node (see col 3 lines 30-60 "neighboring switch"; Fig 1; 110) when the height of the queue of the node is less than the height of the queue of the neighboring node (see col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch….difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ….is routed across each said link such ….is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a….minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue").

For claim 7 and 21, Muthukrishnan discloses packets are routed (see col 4 lines 35-60 "amount of the flow of the data is routed across each link", col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch….difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ….is routed across each said link such ….is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a….minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue") for one or more packets stored in the queues (see Fig 1; queue and col 4 lines 30-60 "links having a pair

of queue buffers...queue buffer pairs....data....queue buffer pairs" and col 2 line 65 through col 3 line 5 "packet-routing...route data") at least one of to and from the node in rounds (see col 4 lines 35-60 "amount of the flow of the data is routed across each link", col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue" and col 3 lines 55-62 "proceeds in rounds") for one or more packets stored in the queues (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs....data....queue buffer pairs" and col 2 line 65 through col 3 line 5 "packet-routing...route data") such that throughput requirements are substantially satisfied (see col 7 lines 27-35 "satisfactory maximum flow value is reaches"), maximizing a processing constraint (see col 7 lines 40-56 "more than 8000 iterations.....method employed ....embodiment....performing 1500 iterations"; less calculation are made at each node) associated with the distributed network (col 7 lines 24-35 "repeated iteratively at each switch...each iteration at each switch" and Fig 1; 10,110 and col 4 lines 30-60 "communication system").

For claim 9 and 23, Muthukrishnan discloses route determining step (see col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of

each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue") further comprises accounting for one or more edge constraints (see col 55-67 "edge....constraints" and col 8 lines 40-60 "capacity constraint")

For claim 15, Muthukrishnan discloses apparatus (see Fig 1; 10) for use in a node (see Fig 1; 10) of a distributed network (see Fig 1; 10,110 and col 4 lines 30-60 "communication system") for routing packets (see col 4 line 47-60 "amount of flow is computed for each link....flow of the data is routed across each link"), the apparatus (see Fig 1; 10) comprising: a memory; and at least one processor (see Fig 1, processor) coupled (see col 13 lines 45-60 "amount in said queue....processor causing said amount of flow..to be routed") to the memory (see Fig 1, processor, queue)

For claim 25, Muthukrishnan discloses an article of manufacture (see Fig 1; 10) for use in a node (see Fig 1; 10) distributed network (see Fig 1; 10,110 and col 4 lines 30-60 "communication system") for routing packets (see col 4 line 47-60 "amount of flow is computed for each link....flow of the data is routed across each link"), comprising a machine readable medium (see Fig 1, processor, queue)

containing one or more programs (see Fig 1, processor, queue)

Muthukrishnan is silent about:

For claim 1, that energy constraint is maximized by minimizing processing operations/load.

For claim 7, substantially maximizing a processing constraint maximizes lifetime

Asai from the same or similar field of endeavor discloses a communication system with the following features:

For claim 1 and 15, Asai discloses that energy constraint is maximized (see col 3 lines 30-40 "power consumption in the...calculation portion can be reduced") by minimizing processing operations/load (see col 3 lines 25-40 "suspends the operation relating...value calculation in the ...calculation portion").

For claim 7 and 21, substantially maximizing a processing constraint (see col 3 lines 25-40 "suspends the operation relating...value calculation in the ...calculation portion"; less calculation) maximizes lifetime (see col 3 lines 30-40 "power consumption in the...calculation portion can be reduced...low power consumption can be provided")

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan by using the features, as taught by Asai (US 6,259,402), in order to provide a device low power consumption (see Asai column 3);

3. Claim 2 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) as applied to claim 1 above, and further in view of Wang et al. (US 2006/0215593)

For claim 2 and 16, Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) discloses the claimed invention as described in paragraph 2.

Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) are silent about:

For claim 2 and 16, distributed network is a mobile ad-hoc network, and further wherein the node and at least one neighboring node communicate over a wireless link

Wang from the same or similar field of endeavor discloses a communication network with the following features:

For claim 2 and 16, Wang discloses distributed network is a mobile ad-hoc network (see Fig 3, 14), and further wherein the node (see fig 3, 44) and at least one neighboring node (see fig 42) communicate over a wireless link (see section 0035 "wireless node, wireless client")

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) by using the features, as taught by Wang, in order to provide QoS and prevent collision (see section 0009-0014)

4. Claim 5,6,19,20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) as applied to claim 1 above, and further in view of Chuah (US US 7,197,025)

For claim 5,6,19,20, Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) discloses the claimed invention as described in paragraph 2.

Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) are silent about:

For claim 5 and 19, node receiving broadcast information from at least one neighboring node pertaining to the height of at least one queue of one neighboring node.

For claim 6 and 20, the node broadcasting information to at least one neighboring node pertaining to the height of at least one queue of the node.

Chuah from the same or similar field of endeavor discloses a communication network with the following features:

For claim 5 and 19, Chuah discloses node (see col 36 lines 14-60 "wireless modem") receiving broadcast information (see col 36 lines 14-60 "flow control signal…is sent…..sets the Xon bit in the frame control field at the time it sends the next broadcast frame to all assocated wireless modems") from at least one neighboring node (see col 36 lines 14-30 "access point") pertaining to the height of at least one queue (see col 36 lines 14-60 "buffer occupancy…. flow control signal…is sent…..sets the Xon bit in the frame control field at the time it sends the next broadcast frame to all assocated wireless modems") of one neighboring node (see col 36 lines 14-20 "access point") .

For claim 6 and 20, Chuah discloses the node (see col 36 lines 14-20 "access point") broadcasting information (see col 36 lines 14-60 "flow control signal…is sent…..sets the Xon bit in the frame control field at the time it sends the next broadcast frame to all assocated wireless modems") to at least one neighboring node (see col 36 lines 14-60 "wireless modem") pertaining to the height of at least one queue of the node (see col 36

lines 14-60 “buffer occupancy.... flow control signal...is sent.....sets the Xon bit in the frame control field at the time it sends the next broadcast frame to all assocated wireless modems”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) by using the features, as taught by Chuah, in order to provide a method of efficiently control the timing and making of access requests by remote hosts (see cols 5-6)

5. Claim 8 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) as applied to claim 1 above, and further in view of Einstein et al (US 2003/0189897)

For claim 8 and 22, Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) discloses the claimed invention as described in paragraph 2.

Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) are silent about:

For claim 8 and 22, network lifetime has an upper bound and a lower bound associated therewith.

Einstein from the same or similar field of endeavor discloses a communication network with the following features:

For claim 8 and 22, Einsten discloses network lifetime has an upper bound (see section 0013 "high uptime") and a lower bound associated therewith (see section 0024 "minimum system uptime").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) by using the features, as taught by Einstein, in order to provide method and apparatus that has mathematically provable uptime (see section 0004-0006)

6. Claim 10 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) as applied to claim 1 above, and further in view of Taib (US 7,254,615)

For claim 10 and 24, Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) discloses the claimed invention as described in paragraph 2.

Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) are silent about:

For claim 10 and 24, distributed network changes one of statically and dynamically.

Taib from the same or similar field of endeavor discloses a communication network with the following features:

For claim 10 and 24, distributed network (see col 2 lines 15-25 "ad hoc networks") changes one of statically (see col 6 lines 45-50 "quasi-static" and col 13 lines 15-20 "static") and dynamically (see col 2 lines 15-25 "form and reform dynamically").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) by using the features, as taught by Taib, in order to distribute data more efficiently around the network that is of a dynamic nature (see col 1)

7. Claim 11, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) and Zavalkovsky (US 7,313,635).

For claim 11, Muthukrishnan discloses a method for routing packets (see col 4 line 47-60 “amount of flow is computed for each link....flow of the data is routed across each link”) in a distributed network (see Fig 1; 10,110 and col 4 lines 30-60 “communication system”) including a plurality of nodes (see Fig 1; 10,110 and col 4 linse 35-50 “plurality of switches including a source and a skin”), the nodes (see Fig 1; 10,110 and col 4 lines 35-50 “plurality of switches including a source and a sink”) being coupled via links (see col 4 lines 35-50 “each of the switches connected to a neighboring switch by a....link") and the nodes (see Fig 1; 10,110 and col 4 lines 35-60 “plurality of switches including a source and a sink”) having queues associated with the links (see Fig 1; queue and col 4 lines 30-60 “links having a pair of queue buffers...queue buffer pairs”), the method comprising the steps of: injecting a packet flow (col 4 lines 30-60 “flow is added at a source”), into the distributed network (see Fig 1; 10,110 and col 4 lines 30-60 “communication system”) at a corresponding source node (col 4 lines 30-60 “flow is added at a source”); equalizing the queues (see col 4 lines 35-60 “the flow is partitioned

evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue") each node (see col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue" and col 7 lines 24-35 "repeated iteratively at each switch...each iteration at each switch") of the distributed network (see Fig 1; 10,110 and col 4 lines 30-60 "communication system"); pushing the packet flow (see col 4 lines 35-60 "amount of the flow of the data is routed across each link") in the distributed network (see Fig 1; 10,110 and col 4 lines 30-60 "communication system") such that packets are moved from a queue with a higher height to a queue with a lower height (see col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os

....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue") in a manner that substantially minimizes processing operations/load (see col 7 lines 40-56 "more than 8000 iterations.....method employed ....embodiment....performing 1500 iterations") at affected nodes (col 7 lines 24-35 "repeated iteratively at each switch...each iteration at each switch") ; and absorbing the packet flow (see col 4 lines 50-55 "routed data is then removed when it reaches a sink or a destination node") at a corresponding sink node (see col 4 lines 50-55 "routed data is then removed when it reaches a sink or a destination node")

For claim 14, Muthukrishnan discloses packets are routed (see col 4 lines 35-60 "amount of the flow of the data is routed across each link", col 4 lines 35-60 "the flow is partitioned evenly among the queue buffers of the communication links of each switch....difference between the amount of data in each of the queue buffer pairs" and see col 5 lines 1-30 "amount of flow Fi os ....is routed across each said link such ....is maximized" and col 4 lines 58-67 "is defined as the difference in a amount of data between a pair of queue buffers" and col 6 amount of data that is in queue 20a....minus the amount of data that is in queue 120" and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue") for one or more packets stored in the queues (see Fig 1; queue and col 4 lines 30-60 "links having a pair of queue buffers...queue buffer pairs....data....queue buffer pairs" and col 2 line 65

through col 3 line 5 “packet-routing…route data”) at least one of to and from the node in rounds (see col 4 lines 35-60 “amount of the flow of the data is routed across each link”, col 4 lines 35-60 “the flow is partitioned evenly among the queue buffers of the communication links of each switch….difference between the amount of data in each of the queue buffer pairs” and see col 5 lines 1-30 ”amount of flow Fi os ….is routed across each said link such ….is maximized” and col 4 lines 58-67 “is defined as the difference in a amount of data between a pair of queue buffers” and col 6 amount of data that is in queue 20a….minus the amount of data that is in queue 120” and Fig 1; 20a, 120" and col 9 lines 5-25 "larger sending queue of the system transmits to the smaller receiving queue" and col 3 lines 55-62 “proceeds in rounds”) for one or more packets stored in the queues (see Fig 1; queue and col 4 lines 30-60 “links having a pair of queue buffers…queue buffer pairs….data….queue buffer pairs” and col 2 line 65 through col 3 line 5 “packet-routing…route data”) such that throughput requirements are substantially satisfied (see col 7 lines 27-35 “satisfactory maximum flow value is reaches”), maximizing a processing constraint (see col 7 lines 40-56 “more than 8000 iterations.....method employed ....embodiment....performing 1500 iterations"; less calculation are made at each node) associated with the distributed network (col 7 lines 24-35 “repeated iteratively at each switch…each iteration at each switch” and Fig 1; 10,110 and col 4 lines 30-60 “communication system”).

Muthukrishnan is silent about:

For claim 11, that minimizing processing operations/load minimizes power dissipation and that heights of queues at the sink node are set to zero.

Asai from the same or similar field of endeavor discloses a communication system with the following features:

For claim 11, Asai discloses that minimizing processing operations/load (see col 3 lines 25-40 "suspends the operation relating...value calculation in the ...calculation portion") minimizes power dissipation (see col 3 lines 30-40 "power consumption in the...calculation portion can be reduced").

Zavalkovsky from the same or similar field of endeavor discloses a communication system with the following features:

For claim 11, Smith discloses that heights of queues (see fig 6, 612, yes) at the sink node (see fig 1b, 106) are set to zero (see fig 6, 612, yes)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan by using the features, as taught by Asai (US 6,259,402) and Zavalkovsky (US 7,313,635), in order to provide a device low power consumption (see Asai column 3); in order to provide simulating load on an application server in order to verify reliability (see Zavalkovsky col 2-3).

8. Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) and Zavalkovsky (US 7,313,635) as applied to claim 11 above, and further in view of Wang et al. (US 2006/0215593)

For claim 12, Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402) and and Zavalkovsky (US 7,313,635) discloses the claimed invention as described in paragraph 7. Muthukrishnan et al. (US 6,377,544) and Asai (US 6,259,402), and Zavalkovsky (US 7,313,635) are silent about:

For claim 12, distributed network is a mobile ad-hoc network, and further wherein the node and at least one neighboring node communicate over a wireless link

Wang from the same or similar field of endeavor discloses a communication network with the following features:

For claim 12, Wang discloses distributed network is a mobile ad-hoc network (see Fig 3, 14), and further wherein the node (see fig 3, 44) and at least one neighboring node (see fig 42) communicate over a wireless link (see section 0035 "wireless node, wireless client")

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan et al. (US 6,377,544) and and Zavalkovsky (US 7,313,635), Asai (US 6,259,402) by using the features, as taught by Wang, in order to provide QoS and prevent collision (see section 0009-0014)

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muthukrishnan et al. (US 6,377,544) in view of Asai (US 6,259,402) and Zavalkovsky (US 7,313,635) as applied to claim 11 above, and further in view of Chuah (US US 7,197,025)

For claim 13, Muthukrishnan et al. (US 6,377,544) and Zavalkovsky (US 7,313,635), Asai (US 6,259,402) discloses the claimed invention as described in paragraph 7. Muthukrishnan et al. (US 6,377,544) and Zavalkovsky (US 7,313,635), Asai (US 6,259,402) are silent about:

For claim 13, node receiving broadcast information from at least one neighboring node pertaining to the height of at least one queue of one neighboring node.

Chuah from the same or similar field of endeavor discloses a communication network with the following features:

For claim 13, Chuah discloses node (see col 36 lines 14-60 "wireless modem") receiving broadcast information (see col 36 lines 14-60 “flow control signal…is sent…..sets the Xon bit in the frame control field at the time it sends the next broadcast frame to all assocated wireless modems”) from at least one neighboring node (see col 36 lines 14-30 "access point") pertaining to the height of at least one queue (see col 36 lines 14-60 “buffer occupancy…. flow control signal…is sent…..sets the Xon bit in the frame control field at the time it sends the next broadcast frame to all assocated wireless modems”) of one neighboring node (see col 36 lines 14-20 "access point") .

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Muthukrishnan et al. (US 6,377,544) and Zavalkovsky (US 7,313,635), Asai (US 6,259,402) by using the features, as taught by Chuah, in order

to provide a method of efficiently control the timing and making of access requests by remote hosts (see cols 5-6)

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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US-2006/0098692 A1	05-2006	D'Angelo, Leo A.	370/522

The above has been recited to show system/methods of flow control.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenan Cehic whose telephone number is (571) 270-3120. The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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KC